

# MI FluFocus

## Influenza Surveillance and Avian Influenza Update

Bureau of Epidemiology  
Bureau of Laboratories



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### ***New updates in this issue:***

- **Michigan:** Influenza activity remains sporadic; RSV activity is declining but remains slightly elevated.
  - **National:** Influenza activity remains steady with the majority of states reporting sporadic activity.
  - **International:** Pandemic 2009 H1N1 transmission continues in West Africa and Southeast Asia.
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### ***\*\*\*2009 Influenza A (H1N1) virus Updates\*\*\****

Please continue to reference the MDCH influenza website at [www.michigan.gov/flu](http://www.michigan.gov/flu) for additional 2009 H1N1 information. Local health departments can find guidance documents in the MI-HAN document library. In addition, additional laboratory-specific information is located at the Bureau of Laboratories H1N1 page at [http://www.michigan.gov/mdch/0,1607,7-132-2945\\_5103-213906--,00.html](http://www.michigan.gov/mdch/0,1607,7-132-2945_5103-213906--,00.html).

### ***\*\*\*Influenza Surveillance Reports\*\*\****

**Michigan Disease Surveillance System:** The week ending March 13<sup>th</sup> showed aggregate influenza reports and individual influenza and 2009 novel influenza reports that were similar to the previous week's levels. Aggregate and individual influenza reports were lower than the levels seen at this time last year.

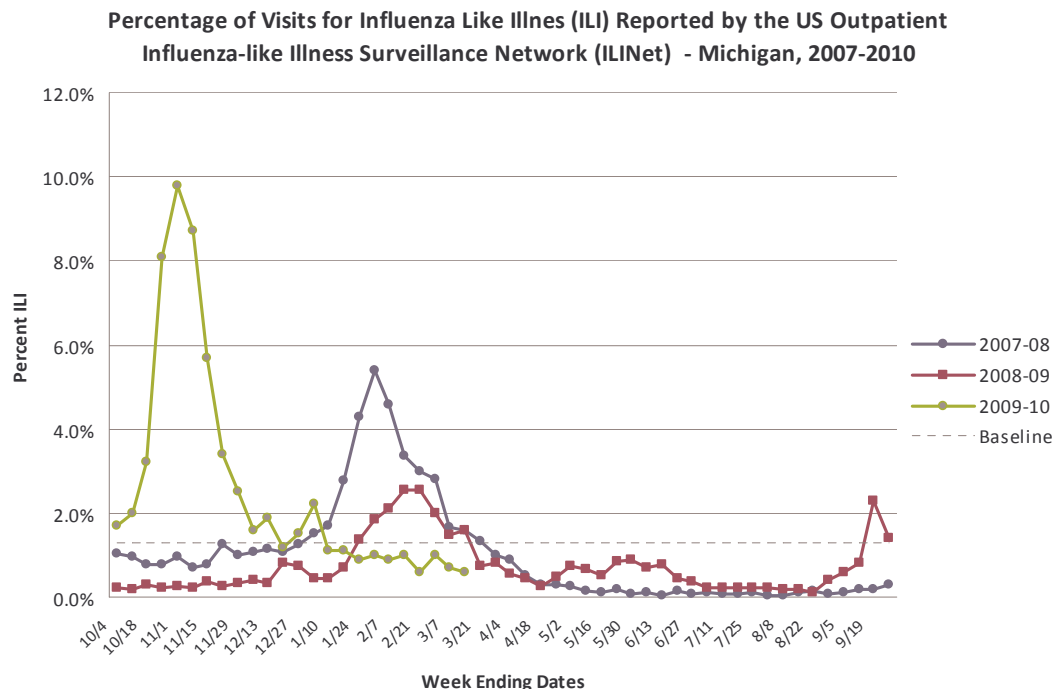
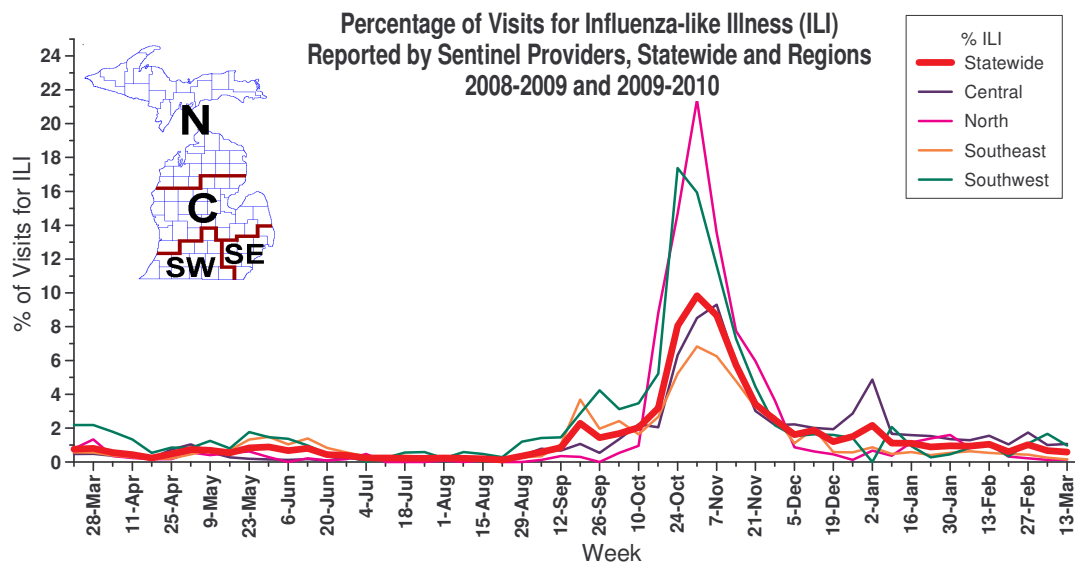
During March 7-13, 2010, 7941 cases of flu-like illness and confirmed and probable cases of seasonal and novel influenza were reported in Michigan. 2121 hospitalizations and 78 deaths associated with influenza have been reported since September 1, 2009. This report is updated every Tuesday by 5:00 pm and is accessible at "Current H1N1 Activity" on the website <http://www.michigan.gov/h1n1flu>.

**Emergency Department Surveillance:** Emergency department visits from constitutional and respiratory complaints were consistent with previous week's levels. Respiratory complaints were comparable to what was seen at this time last year, while constitutional complaints were slightly lower. In the past week, there were four constitutional alerts in the C(2), SE(1), and N(1) Influenza Surveillance Regions, and seven respiratory alerts in the C(6) and N(1) Influenza Surveillance Regions.

**Over-the-Counter Product Surveillance:** Overall, OTC product sales were mostly steady over the last week. Pediatric electrolyte sales increased slightly, while the remaining indicators were consistent with the previous week's levels. All product sales were consistent with levels seen during this time last year.

**Sentinel Provider Surveillance (as of March 18):** During the week ending March 13, 2010, the proportion of visits due to influenza-like illness (ILI) slightly decreased to 0.6% overall; 59 patient visits due to ILI were reported out of 10,192 office visits. Twenty-nine sentinel sites provided data for this report. Activity increased in one surveillance region: Central (1.1%) and decreased in the remaining three surveillance regions: Southwest (1.0%), North (0.1%) and Southeast (0.2%). Please note that these rates may change as additional reports are received.

As part of pandemic influenza surveillance, CDC and MDCH highly encourage year-round participation from all sentinel providers. New practices are encouraged to join the sentinel surveillance program today! Contact Cristi Carlton at 517-335-9104 or [CarltonC2@michigan.gov](mailto:CarltonC2@michigan.gov) for more information.



**Laboratory Surveillance (as of March 13):** During March 7-13, MDCH Bureau of Laboratories identified no influenza isolates. For the 2009-2010 season (starting on October 4, 2009), MDCH BOL has identified 606 influenza isolates:

- 2009 Influenza A (H1N1): 605
- Influenza B: 1

15 sentinel labs reported for the week ending March 13, 2010. 4 labs reported sporadic influenza A activity (SE, SW, C); all others reported zero influenza A positives (SE, SW, C, N). No labs reported influenza B positives. 8 labs reported zero or low levels of RSV positives (SE, SW, C, N), and 7 labs reported moderately elevated but decreasing RSV positives (SE, SW, C).

**Michigan Influenza Antigenic Characterization (as of March 18):** One 2009 H1N1 influenza A virus from Michigan has undergone further characterization at the CDC. This virus was characterized as A/California/07/2009 (H1N1)-like, which is the recommended strain for the H1 component of the 2010-11 Northern Hemisphere vaccine.

**Michigan Influenza Antiviral Resistance Data (as of March 18):** Results are currently not available for antiviral resistance at CDC for the 2009-2010 season.

Antiviral resistance testing takes months to complete and cannot be used to guide individual patient treatment. However, CDC has made recommendations regarding the use of antivirals for treatment and prophylaxis of influenza. The guidance is available at <http://www.cdc.gov/H1N1flu/recommendations.htm>.

**Influenza-Associated Pediatric Mortality (as of March 18):** Five 2009 H1N1 influenza-associated pediatric mortalities (SE(3), SW, N) have been reported to MDCH for the 2009-2010 influenza season.

\*\*\*CDC has asked states for information on any pediatric death associated with influenza. This includes not only any pediatric death (<18 years) resulting from a compatible illness with laboratory confirmation of influenza, but also any unexplained pediatric death with evidence of an infectious process. Please immediately call MDCH to ensure proper specimens are obtained. View the complete MDCH protocol online at [http://www.michigan.gov/documents/mdch/ME\\_pediatric\\_influenza\\_guidance\\_v2\\_214270\\_7.pdf](http://www.michigan.gov/documents/mdch/ME_pediatric_influenza_guidance_v2_214270_7.pdf).

**Influenza Congregate Settings Outbreaks (as of March 18):** Seven congregate setting outbreaks with confirmatory novel influenza A H1N1 testing (2SE, 3 SW, 1C, 1N), and two outbreaks associated with positive influenza A tests (1C, 1N) have been reported to MDCH for the 2009-2010 influenza season. These are 8 school facilities and 1 long term care facility. Human metapneumovirus was confirmed in one outbreak in a long term care facility (SW) in February.

During fall 2009, 567 influenza-related school and/or district closures in Michigan (Public Health Preparedness Region 1 - 55, Region 2N - 4, Region 2S - 8, Region 3 - 54, Region 5 - 153, Region 6 - 100, Region 7 - 109, Region 8 - 84) were reported.

**National (CDC [edited], March 12):** During week 9 (February 28 – March 6, 2010), influenza activity remained at approximately the same levels as last week in the U.S. 174 (5.1%) specimens tested by U.S. World Health Organization (WHO) and National Respiratory and Enteric Virus Surveillance System (NREVSS) collaborating laboratories and reported to CDC/Influenza Division were positive for influenza. All subtyped influenza A viruses reported to CDC were 2009 influenza A (H1N1) viruses. The proportion of deaths attributed to pneumonia and influenza (P&I) was below the epidemic threshold. No influenza-associated pediatric deaths were reported. The proportion of outpatient visits for influenza-like illness (ILI) was 1.9% which is below the national baseline of 2.3%. Three of 10 regions (Regions 4, 7, and 9) reported ILI at or above region-specific baseline levels. No states reported widespread influenza activity, five states reported regional influenza activity, Puerto Rico and six states reported local influenza activity, Guam, and 33 states reported sporadic influenza activity, the U.S. Virgin Islands and six states reported no influenza activity, and the District of Columbia did not report.

To access the entire CDC weekly surveillance report, visit <http://www.cdc.gov/flu/weekly/fluactivity.htm>

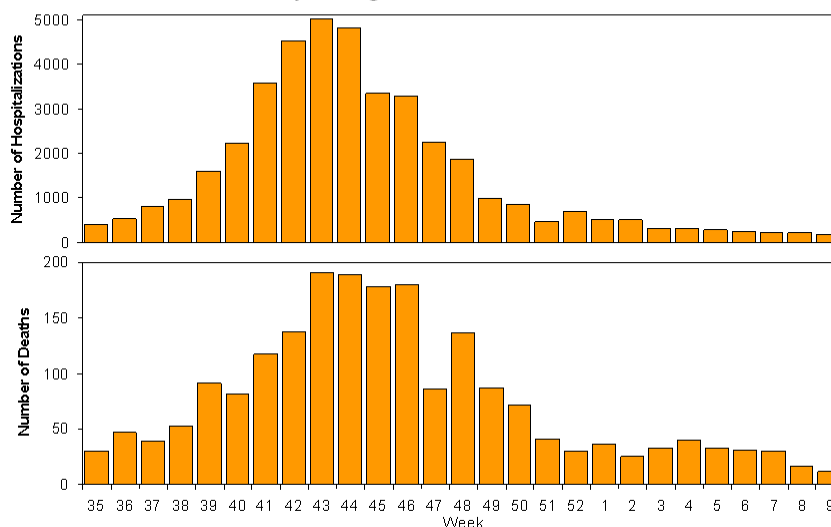
From <http://www.cdc.gov/h1n1flu/updates/us/#totalcases>:

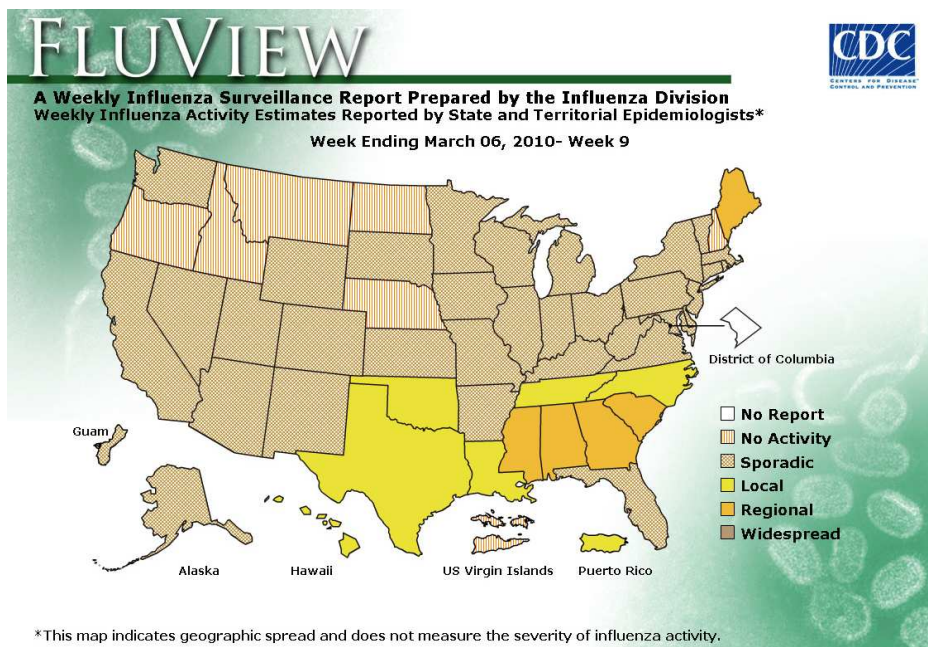
*U.S. Influenza and Pneumonia-Associated Hospitalizations and Deaths from Aug 30, 2009–Mar 6, 2010*

Cases Defined by	Hospitalizations	Deaths
Influenza Laboratory-Tests**	41,113	2,042

\*\*States report weekly to CDC either 1) laboratory-confirmed influenza hospitalizations and deaths or 2) pneumonia and influenza syndrome-based cases of hospitalization and death resulting from all types or subtypes of influenza. Although only the laboratory confirmed cases are included in this report, CDC continues to analyze data both from laboratory confirmed and syndromic hospitalizations and deaths.

**Weekly Laboratory-Confirmed Influenza-Associated Hospitalizations and Deaths Reported to AHDRA, National Summary, August 30, 2009 – March 6, 2010**





**International (WHO Pandemic Update 91 [edited], March 12):** The most active areas of pandemic influenza transmission are currently in Southeast Asia, however, lower levels of pandemic virus circulation persist in other parts of Asia and in Eastern and South-eastern Europe. In West Africa, limited data suggests that pandemic influenza virus transmission may be increasing in region. Of note, seasonal influenza B viruses have been increasingly detected in Asia and appear to be spreading westward.

In Sub-Saharan Africa, limited data suggests that on-going community transmission of pandemic influenza virus continues to increase in parts of West Africa, without clear evidence of a peak in activity. Increased detections of pandemic influenza virus have been observed among sentinel surveillance sites in several countries, including Senegal and Cote D'Ivoire, however, to date, data is limited regarding the spectrum of clinical severity of cases. Recent increases in influenza activity have also been reported in Rwanda. Much of eastern and southern Africa likely experienced an earlier peak in pandemic influenza activity during November 2009 and late summer 2009, respectively.

In South and Southeast Asia, pandemic influenza virus circulation persist in most countries, however, overall transmission remains most active in Thailand, especially since mid January 2010. Approximately half of all provinces in Thailand reported that greater than 10% of all outpatients sought care for ILI, and approximately 25% of all patients with ILI at sentinel sites tested positive for influenza. The current increase in the number of cases in Thailand remains well below an earlier period of peak transmission during June through September 2009. In Bangladesh, an increasing trend in respiratory disease was reported, however, overall influenza activity remains low. In India, influenza virus transmission persists at lower levels in the western region of India, while activity in other regions has largely subsided.

In East Asia, pandemic influenza activity continues to decrease or remain low as levels of ILI return to seasonal baselines in Japan and in the Republic of Korea. In Mongolia, a recent sharp increase in ILI activity was associated predominantly with a resurgence of circulation of seasonal influenza B viruses. In China, pandemic influenza activity has declined since peaking during November 2009, however, overall influenza activity remains elevated, largely due to an increase in the circulation of seasonal influenza B viruses.

In North Africa and Western Asia, overall pandemic influenza activity remains low in most places, with the exception of Iraq and Afghanistan, both of which reported regional spread of influenza with an increasing trend in respiratory diseases activity. In Afghanistan, a moderate impact on the healthcare system was reported in association with increased respiratory diseases activity. Although overall influenza activity remains low in Iran, all recent influenza virus detections have been due to seasonal influenza B viruses.

In Europe, overall pandemic influenza transmission continued to decline as low levels of pandemic virus continue to circulate in parts of eastern and south-eastern Europe. The overall percentage of sentinel respiratory specimens testing positive for influenza remained low (6.8%) but slightly increased compared to the previous week. Pandemic H1N1 2009 virus continues to be the predominant circulating influenza

virus in the European region with the exception of the Russian Federation and Sweden where influenza B was reported as co-dominant or dominant.

In the northern and the southern temperate zones of the Americas, overall pandemic influenza transmission remained low as influenza virus continued to circulate at low levels. In Central America, Nicaragua and Honduras, reported slight increases in respiratory diseases activity, possibly due to an increase in school outbreaks; however, it is unclear to what extent the increases are associated with circulation of pandemic influenza virus. In Brazil, an increasing trend of respiratory diseases with low overall intensity was reported in association with regional spread of influenza virus.

In the temperate zone of the southern hemisphere, overall influenza activity remained low, with sporadic detections of pandemic and seasonal influenza viruses.

Although pandemic influenza virus continues to be the predominant circulating influenza virus worldwide, circulation of seasonal influenza B viruses continue to increase and spread across Asia, parts of Eastern Europe, and Eastern Africa, but most notably in China, Mongolia, Iran and the Russian Federation.

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MDCH reported **SPORADIC INFLUENZA ACTIVITY** to the CDC for the week ending March 13, 2010.

For those interested in additional influenza vaccination and education information, the MDCH *FluBytes* is available at [http://www.michigan.gov/mdch/0,1607,7-132-2940\\_2955\\_22779\\_40563-125027--,00.html](http://www.michigan.gov/mdch/0,1607,7-132-2940_2955_22779_40563-125027--,00.html).

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### ***Novel Influenza Activity and Other News***

**WHO Pandemic Phase:** Phase 6 – characterized by increased and sustained transmission in the general population. Human to human transmission of an animal or human-animal influenza reassortant virus has caused sustained community level outbreaks in at least two WHO regions.

**National, Research (University of North Carolina press release, March 11):** Rhesus monkey babies born to mothers who had the flu while pregnant had smaller brains and showed other brain changes similar to those observed in human patients with schizophrenia, a study at the University of Wisconsin-Madison in collaboration with the University of North Carolina at Chapel Hill has found.

The study, published online by the journal *Biological Psychiatry*, is the first study done with monkeys that examines the effects of flu during pregnancy. Results from this study support findings from rodent studies suggesting this type of infection may increase the risk of schizophrenia in the offspring, said lead author Sarah J. Short, Ph.D.

Short worked on the study while earning her doctorate at Wisconsin and now is a post-doctoral fellow at UNC working with John H. Gilmore, M.D., professor of psychiatry in the UNC School of Medicine.

“This was a relatively mild flu infection, but it had a significant effect on the brains of the babies,” Short said. “While these results aren’t directly applicable to humans, I do think they reinforce the idea, as recommended by the Centers for Disease Control and Prevention, that pregnant women should get flu shots, before they get sick.”

In the study, 12 rhesus macaques were infected with a mild influenza A virus 1 month before their baby’s due date, early in the third trimester of pregnancy. For comparison, the study also included 7 pregnant monkeys who did not have the flu.

When the babies were 1 year old, magnetic resonance imaging (MRI) scans were taken of their brains. Researchers also assessed the babies’ behavioral development at that time.

The babies born to flu-infected mothers showed no evidence of direct viral exposure. Their birth weight, gestation length and neuromotor, behavioral and endocrine responses were all normal.

However, the MRI scans revealed significant reductions in overall brain size in the flu-exposed babies. In addition, the scans found significant reductions of “gray matter” (the portion of brain tissue that is dark in color) especially in areas of the brain called the cingulate and parietal lobe, and significant reductions of “white matter” (brain tissue that is lighter in color) in the parietal lobe.

The cingulate is located in the middle of the brain, but spans a broad distance from front to back and

relays information from both halves of the brain. This structure is important for numerous cognitive function related to emotions, learning, memory, and executive control of these processes to aid in decision-making and anticipation of rewards. In addition this structure also plays a role in regulating autonomic processes, such as blood pressure and respiratory control. The parietal lobe comprises a large section on both sides of the brain between the frontal lobes and the occipital lobes, in the back of the brain. This part of the brain integrates information from all the senses and is especially important for combining visual and spatial information.

“The brain changes that we found in the monkey babies are similar to what we typically see in MRI scans of humans with schizophrenia,” said Gilmore. “This suggests that human babies whose mothers had the flu while pregnant may have a greater risk of developing schizophrenia later in life than babies whose mothers did not have the flu. Normally that risk affects about 1 of every 100 births. Studies in humans suggest that for flu-exposed babies, the risk is 2 or 3 per 100 births.”

Most of the work of the study was done at the Harlow Center for Biological Psychology, which is part of Wisconsin’s Department of Psychology. The center’s director, Christopher Coe, Ph.D., is senior author of the study. Gilmore, a schizophrenia researcher who has led several studies that used MRI scans of newborn human brains, led the analysis of MRI data in the pregnancy and influenza study.

**International, Human (WHO, March 12):** The Ministry of Health of Egypt has announced two new cases of human H5N1 avian influenza infection.

The first case is a 20 year-old pregnant female from El Khanka district, Qaliobia Governorate. She was hospitalized on 5 March where she received oseltamivir treatment and died on 9 March.

The second case is a 1 and a half year-old male from Elhamool district, Kfr Elsheikh Governorate. He was hospitalized on 2 March, where he received oseltamivir treatment. He is in a stable condition.

Investigations into the source of infection indicated that the two cases had exposure to sick and dead poultry.

The cases were confirmed by the Egyptian Central Public Health Laboratories, a National Influenza Center of the WHO Global Influenza Surveillance Network (GISN).

Egyptian authorities have also reported the death of a previously announced case; the 53 year-old male from Shobra Elkhima district, Qaliobia Governorate who developed symptoms on 27 February.

Of the 106 laboratory confirmed cases of Avian influenza A(H5N1) reported in Egypt, 32 have been fatal.

**International, Human (WHO, March 16):** The Ministry of Health has reported a new confirmed case of human infection with the H5N1 avian influenza virus. This case was confirmed at the National Institute of Hygiene and Epidemiology (NIHE).

The case is a 25 year old woman residing in Soc Son District, Hanoi. She developed symptoms on 5 March 2010 and was hospitalized on 7 March 2010 at North Thang Long Hospital. On 10 March 2010, her condition had worsened so she was transferred to Bach Mai Hospital where she is being provided with ventilation.

An epidemiological investigation showed that the patient had exposure to sick and dead poultry.

Of the 116 cases confirmed to date in Viet Nam, 58 have been fatal.

**International, Poultry (Voice of Vietnam website, March 15):** The Bac Ninh provincial People's Committee on March 14 announced the occurrence of bird flu in Nam Son commune, Bac Ninh city [Vietnam]. Previously, the poultry of a farmer family in Da Cau hamlet of this commune died in mass numbers.

The provincial animal health department said farmer Dam Thi Chinh raised 400 heads of fowl, which had been vaccinated for four months but died massively on the night of March 11. They first showed signs sickness on March 10.

The veterinary agency inspected the family's farm on March 12 and concluded that Ms Chinh's poultry had signs of being infected with avian flu. It later destroyed all the birds and sent two samples of the disease to a central veterinary diagnosis centre for further testing. The agency also had the entire Da Cau hamlet disinfected with lime and cloramin B.

The Bac Ninh Animal Health Department has set up two temporary checkpoints at the hamlet, suspended all activities involving poultry in markets within Nam Son commune, vaccinated all the fowl in the commune and is closely monitoring the slaughter of poultry in an effort to prevent the epidemic from spreading.

**International, Poultry (OIE [edited], March 16):** Highly pathogenic avian influenza H5N1; Romania

Date of first confirmation of the event: 15/03/2010; Date of Start of Event: 13/03/2010

Date of report: 16/03/2010; Date Submitted To OIE: 16/03/2010

Province: TULCEA; Location: Letea

Species: Birds; Susceptible: 47; Cases: 47; Deaths: 47; Destroyed: 0; Slaughtered: 0

Affected Population: Backyard poultry

Epidemiological comments: The disease was suspected on 13 March 2010 in two birds in two backyards with a population of 47 birds. Letea is a small locality in the Danube Delta, on a land isolated by water, composed of 165 backyards, access being achieved by boat. Samples were taken and sent to the National Reference Laboratory for confirmation and, on 15 March 2010, a positive result for H5N1 subtype was confirmed by RT-PCR.

Source of the outbreak(s) or origin of infection: Contact with wild species

Control Measures Applied: Control of wildlife reservoirs, Movement control inside the country, Screening, Zoning, Disinfection of infected premises/establishment(s)

To be applied: No Planned Control Measures

Animals treated: No

**Michigan Wild Bird Surveillance (USDA, as of March 18):** For the 2009 testing season (April 1, 2009-March 31, 2010), HPAI subtype H5N1 has not been recovered from any of the 111 Michigan samples tested to date, including 58 live wild birds, 39 hunter-killed birds and 14 morbidity/mortality specimens. H5N1 HPAI has not been recovered from 19,047 samples tested nationwide. For more information, visit the National HPAI Early Detection Data System at <http://wildlifedisease.nbj.gov/ai/>.

To learn about avian influenza surveillance in Michigan wild birds or to report dead waterfowl, go to Michigan's Emerging Disease website at <http://www.michigan.gov/emergingdiseases>.

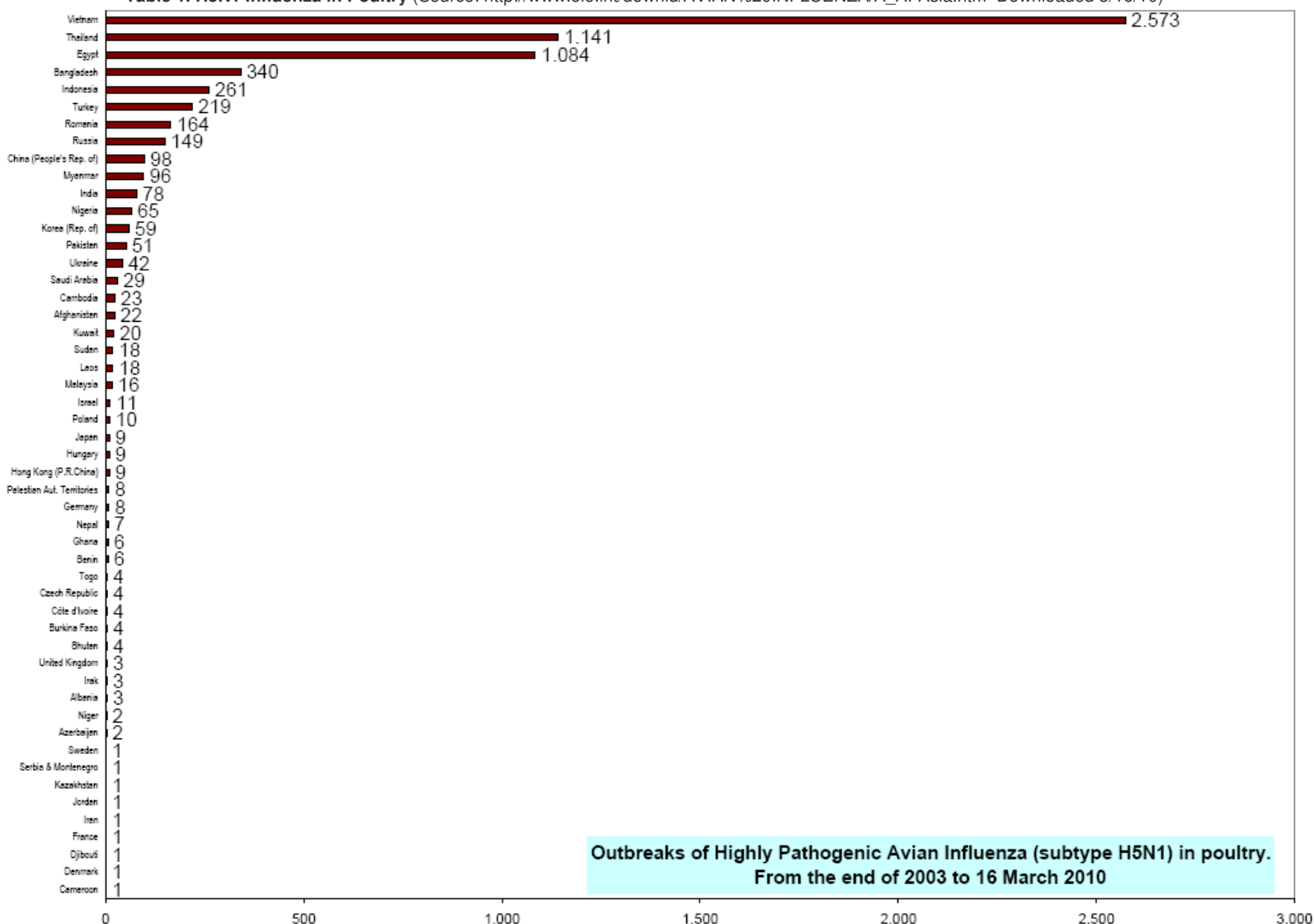
**Please contact Susan Peters at [PetersS1@Michigan.gov](mailto:PetersS1@Michigan.gov) with any questions regarding this newsletter or to be added to the weekly electronic mailing list.**

**Contributors**

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**Table 1. H5N1 Influenza in Poultry** (Source: [http://www.oie.int/downld/AVIAN%20INFLUENZA/A\\_AI-Asia.htm](http://www.oie.int/downld/AVIAN%20INFLUENZA/A_AI-Asia.htm) Downloaded 3/16/10)



**Table 2. H5N1 Influenza in Humans - Cases up to March 16, 2010.** [http://www.who.int/csr/disease/avian\\_influenza/country/cases\\_table\\_2010\\_03\\_16/en/index.html](http://www.who.int/csr/disease/avian_influenza/country/cases_table_2010_03_16/en/index.html). Downloaded 3/17/2010. Cumulative number of lab-confirmed cases reported to WHO. Total cases includes deaths.

Country	2003		2004		2005		2006		2007		2008		2009		2010		Total	
	cases	deaths	cases	deaths	cases	deaths	cases	deaths	cases	deaths	cases	deaths	cases	deaths	cases	deaths	cases	deaths
Azerbaijan	0	0	0	0	0	0	8	5	0	0	0	0	0	0	0	0	8	5
Bangladesh	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0
Cambodia	0	0	0	0	4	4	2	2	1	1	1	0	1	0	0	0	9	7
China	1	1	0	0	8	5	13	8	5	3	4	4	7	4	0	0	38	25
Djibouti	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	0
Egypt	0	0	0	0	0	0	18	10	25	9	8	4	39	4	16	5	106	32
Indonesia	0	0	0	0	20	13	55	45	42	37	24	20	21	19	1	1	163	135
Iraq	0	0	0	0	0	0	3	2	0	0	0	0	0	0	0	0	3	2
Lao People's Democratic Republic	0	0	0	0	0	0	0	0	2	2	0	0	0	0	0	0	2	2
Myanmar	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0
Nigeria	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	1	1
Pakistan	0	0	0	0	0	0	0	0	3	1	0	0	0	0	0	0	3	1
Thailand	0	0	17	12	5	2	3	3	0	0	0	0	0	0	0	0	25	17
Turkey	0	0	0	0	0	0	12	4	0	0	0	0	0	0	0	0	12	4
Viet Nam	3	3	29	20	61	19	0	0	8	5	6	5	5	5	4	1	116	58
Total	4	4	46	32	98	43	115	79	88	59	44	33	73	32	21	7	489	289